Monitoring Results Quarterly Review

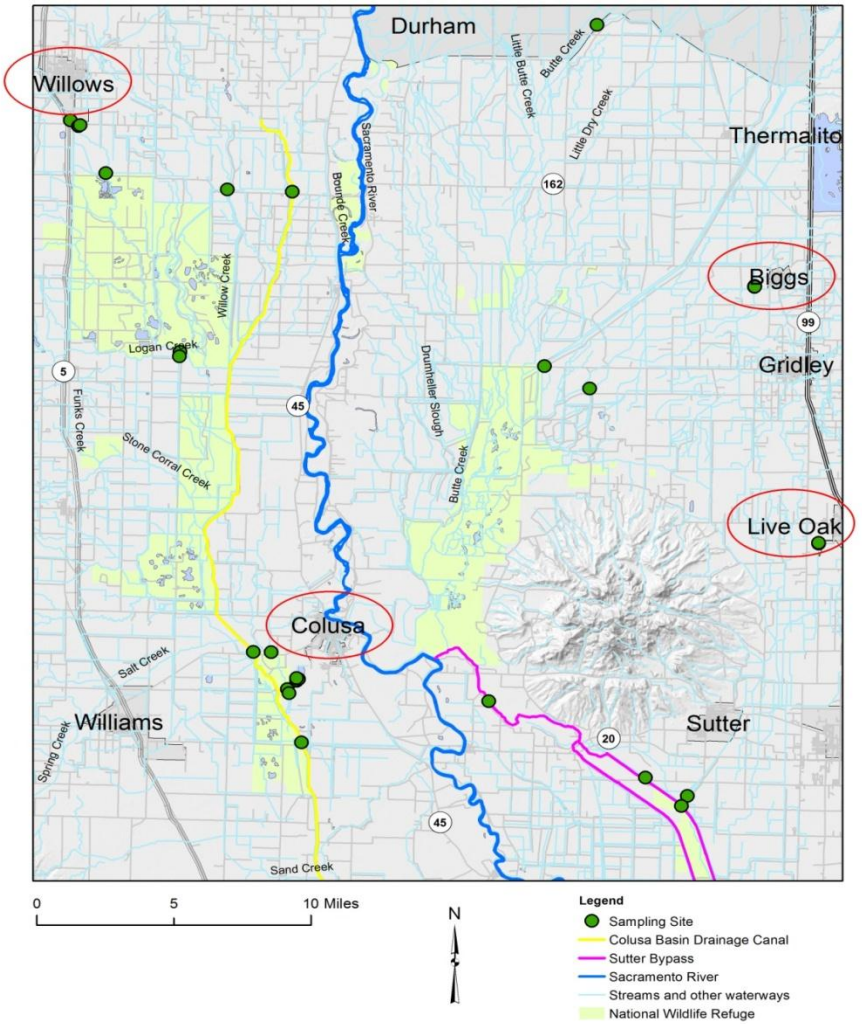
July 2012 – September 2012

Sacramento Valley Archetypes

Westside: Willows, Colusa

Eastside: Biggs, Live Oak

MUN Beneficial Use Study - Site Map



All Effluent and Receiving Water Sites (July – September 2012)

Parameter	Frequency	Number of Samples with Exceedances (Total Samples)	Criteria
Aluminum - Total	1/month	67 (89)	200 µg/L
Aluminum - Dissolved	Quarterly	0 (29)	200 µg/L
Arsenic - Total	1/month	12 (89)	10 µg/L
Arsenic - Dissolved	Quarterly	3 (13)	10 µg/L
Iron - Total	1/month	68 (89)	300 µg/L
Iron - Dissolved	Quarterly	0 (29)	300 µg/L
Manganese - Total	1/month	63 (89)	50 µg/L
Manganese - Dissolved	Quarterly	6 (29)	50 µg/L
MBAS	1/month	0 (43)	500 µg/L
Nitrate as N	1/month	14 (72)	10 mg/L
Boron	1/month	0 (89)	1 mg/L
Sodium	1/month	63 (89)	20 mg/L
Hardness	1/month	(89)	N/A
Bromoform	1/month	0 (46)	4.3 µg/L
Chloroform	1/month	3 (46)	5.7 µg/L
Bromodichloromethane	1/month	2 (46)	0.56 µg/L
Dibromochloromethane	1/month	2 (46)	0.41 µg/L
Conductance	2/month	17 (174)	900 µS/cm
Turbidity	2/month	(174)	
pH	2/month	2 (174)	6.5 - 8.5
photos	2/month	(725)	
DO	2/month	(174)	
Temperature	2/month	(174)	

Quarterly Scan at All Effluent and Receiving Water Sites (July – September 2012)

Parameter	Number of Samples with Exceedances (Total Samples)	Criteria
Antimony - Total	0 (29)	6 µg/L
Barium - Total	0 (29)	1 mg/L
Beryllium - Total	0 (29)	4 µg/L
Cadmium - Total	0 (29)	5 µg/L
Chromium - Total	0 (29)	50 µg/L
Copper - Total	0 (29)	1 mg/L
Lead - Total	0 (29)	15 µg/L
Mercury - Total	0 (29)	2 µg/L
Molybdenum - Total	0 (29)	35 µg/L
Nickel - Total	0 (29)	100 µg/L
Selenium - Total	0 (29)	50 µg/L
Silver - Total	0 (29)	100 µg/L
Thallium - Total	0 (29)	2 µg/L
Zinc - Total	0 (29)	5 mg/L
Perchlorate	0 (29)	6 µg/L
Chloride	0 (29)	250 mg/L
Fluoride	0 (29)	2.0 mg/L
Sulfate	0 (29)	250 mg/L
Ammonia as N	3 (7)	1.5 mg/L
Total Dissolved Solids	7 (29)	500 mg/L

Colusa Exceedances (July – September 2012)

Site	Number of Samples with Exceedances (Total Samples)								
	Aluminum - Total	Arsenic - Total	Iron - Total	Manganese - Total	Manganese - Dissolved	Nitrate as N	Sodium	TDS	Conductivity
Criteria:	200 µg/L	10 µg/L	300 µg/L	50 µg/L	50 µg/L	10 mg/L	20 mg/L	500 mg/L	900 µS/cm
Colusa Basin Drain at Highway 20	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)
Powell Slough at Highway 20	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	**1 (1)**	0 (2)	**3 (3)**	0 (1)	0 (5)
New Ditch	**2 (2)**	**1 (2)**	**2 (2)**	**2 (2)**	0 (0)	0 (1)	**2(2)**	0 (0)	**5 (5)**
Unnamed Tribuary, Upstream of Discharge	**3 (3)**	**3 (3)**	**3 (3)**	**3 (3)**	**1 (1)**	0 (2)	**3 (3)**	**1 (1)**	**4 (6)**
Effluent	0 (3)	0 (3)	0 (3)	0 (3)	0 (1)	**2 (2)**	**3 (3)**	**1 (1)**	0 (5)
Unnamed Tribuary, Downstream of Discharge	**2 (3)**	**1 (3)**	**2 (3)**	**2 (3)**	0 (1)	**1 (2)**	**3 (3)**	**1 (1)**	**5 (6)**
Powell Slough, Upstream of Unnamed Tributary	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)
Powell Slough, Downstream of Unnamed Tributary	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	**2 (6)**
Colusa Basin Drain at Abel Road	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)

Willows Exceedances (July – September 2012)

Site	Number of Samples with Exceedances (Total Samples)											
	Aluminum - Total	Arsenic - Total	Iron - Total	Manganese - Total	Manganese - Dissolved	Nitrate as N	Sodium	TDS	Conductivity	Chloroform	Bromodichloro methane	Dibromochloro methane
Criteria:	200 µg/L	10 µg/L	300 µg/L	50 µg/L	50 µg/L	10 mg/L	20 mg/L	500 mg/L	900 µS/cm	5.7 µg/L	0.56 µg/L	0.41 µg/L
Ag Drain C, Upstream of Discharge	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)	0 (1)	0 (1)	0 (1)
Effluent	0 (3)	0 (3)	0 (3)	0 (3)	0 (1)	**2 (2)**	**3 (3)**	**1 (1)**	0 (6)	**2 (2)**	**2 (2)**	**2 (2)**
Ag Drain C, Downstream of Discharge	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)	0 (2)	0 (2)	0 (2)
Ag Drain C at Road 60	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)	0 (1)	0 (1)	0 (1)
Willow Creek at Road 61	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	**1 (1)**	0 (2)	**1 (3)**	0 (1)	0 (6)	0 (1)	0 (1)	0 (1)
Colusa Basin Drain at Road 61	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**2 (3)**	0 (1)	0 (6)	0 (1)	0 (1)	0 (1)
Logan Creek, Downstream of Effluent	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)	0 (1)	0 (1)	0 (1)
Hunters Creek, Downstream of Effluent	**3 (3)**	0 (3)	**3 (3)**	**3 (3)**	0 (1)	0 (2)	**3 (3)**	0 (1)	0 (6)	0 (1)	0 (1)	0 (1)

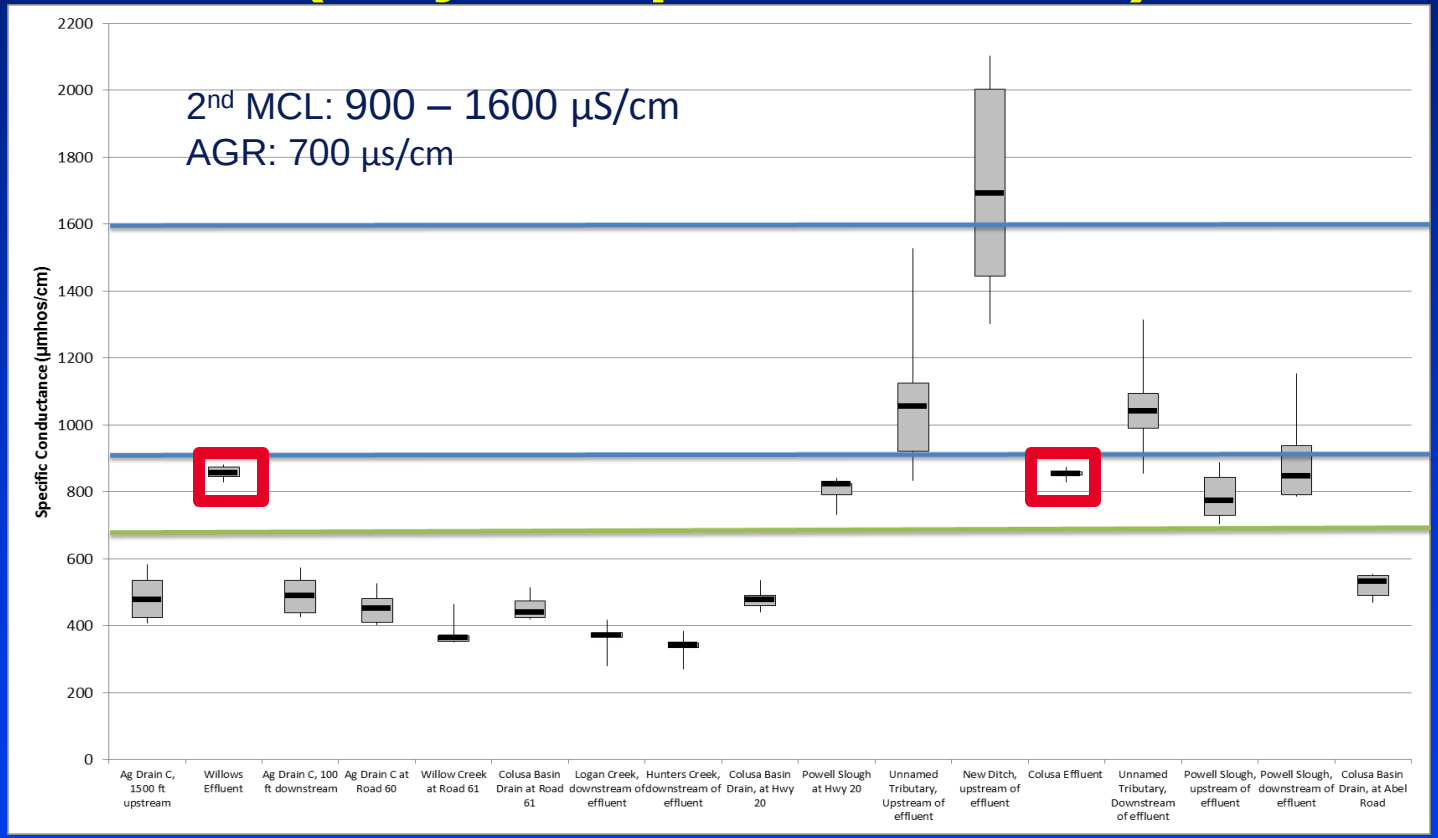
Live Oak Exceedances (July – September 2012)

Site	Number of Samples with Exceedances (Total Samples)									
	Aluminum - Total	Arsenic - Total	Arsenic - Dissolved	Iron - Total	Manganese - Total	Manganese - Dissolved	Nitrate as N	Sodium	TDS	Conductivity
Criteria:	200 µg/L	10 µg/L	10 µg/L	300 µg/L	50 µg/L	50 mg/L	10 mg/L	20 mg/L	500 mg/L	900 µS/cm
Lateral #2, Upstream of Discharge	**2 (3)**	**3 (3)**	**1 (1)**	**1 (3)**	**1 (3)**	0 (1)	**3 (3)**	**3 (3)**	**1 (1)**	0 (5)
Effluent	0 (3)	**2 (3)**	**1 (1)**	0 (3)	0 (3)	0 (1)	**3 (3)**	**3 (3)**	**1 (1)**	0 (5)
Lateral #2, Downstream of Discharge	0 (3)	**2 (3)**	**1 (1)**	0 (3)	0 (3)	0 (1)	**3 (3)**	**3 (3)**	**1 (1)**	0 (5)
Wadworth Canal, Downstream of Effluent	**3 (3)**	0 (3)	0 (1)	**3 (3)**	**3 (3)**	0 (1)	0 (3)	0 (3)	0 (1)	0 (5)
Sutter Bypass, Upstream of Effluent	**3 (3)**	0 (3)	0 (1)	**3 (3)**	**3 (3)**	0 (1)	0 (3)	**1 (3)**	0 (1)	0 (6)
Sutter Bypass, Downstream of Effluent	**3 (3)**	0 (3)	0 (1)	**3 (3)**	**3 (3)**	0 (1)	0 (3)	0 (3)	0 (1)	0 (6)

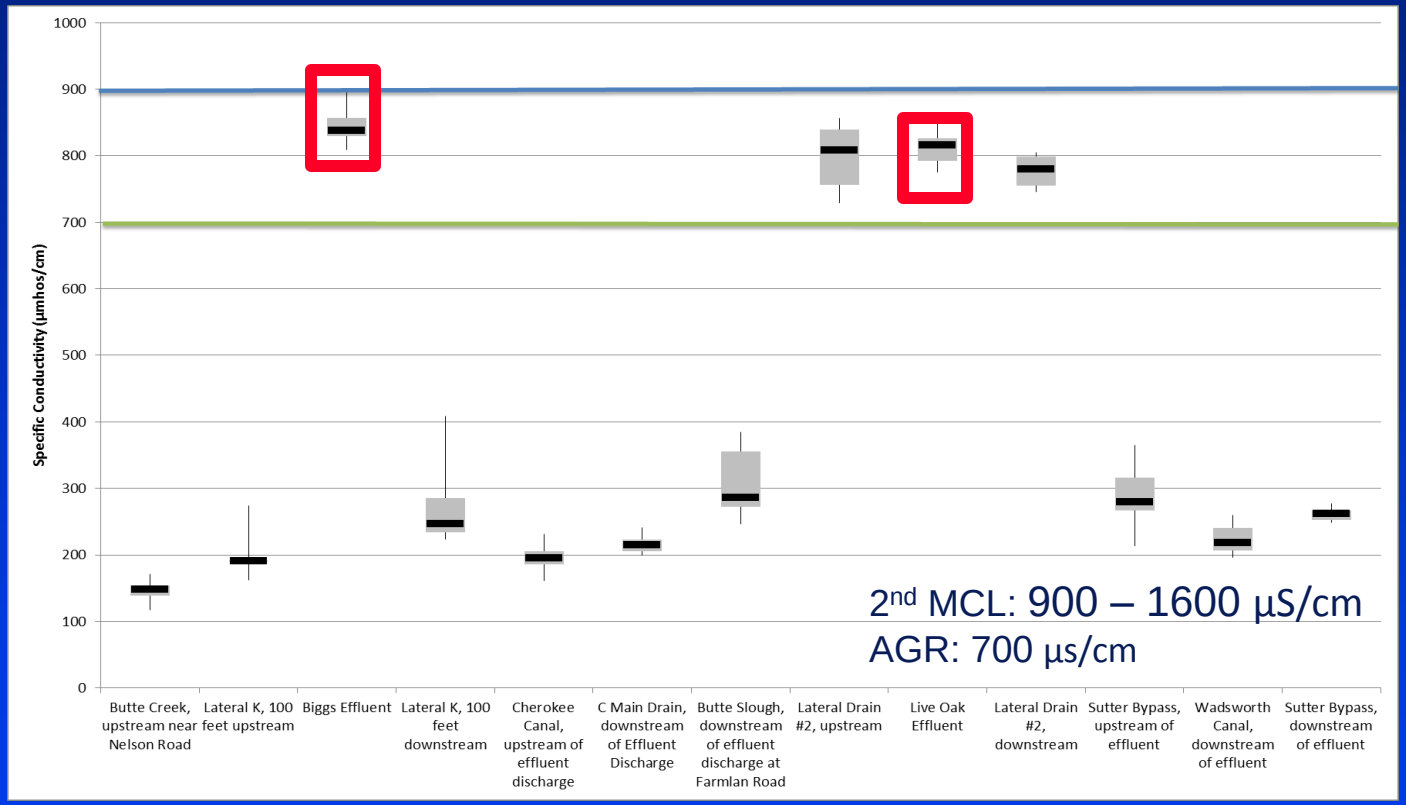
Biggs Exceedances (July – September 2012)

Site	Number of Samples with Exceedances (Total Samples)										
	Aluminum - Total	Arsenic - Total	Arsenic - Dissolved	Iron - Total	Manganese - Total	Manganese - Dissolved	Nitrate as N	Sodium	TDS	Conductivity	Ammonia as N
Criteria:	200 µg/L	10 µg/L	10 µg/L	300 µg/L	50 µg/L	50 mg/L	10 mg/L	20 mg/L	500 mg/L	900 µS/cm	1.5 mg/L
Butte Creek near Nelson Road	0 (3)	0 (3)	0 (1)	0 (3)	0 (3)	0 (1)	0 (3)	0 (3)	0 (1)	0 (6)	0 (1)
Lateral K, Upstream of Discharge	**3 (3)**	0 (3)	0 (1)	**3 (3)**	**3 (3)**	**1 (1)**	0 (3)	0 (3)	0 (1)	0 (6)	0 (1)
Effluent	0 (3)	0 (3)	0 (1)	0 (3)	0 (3)	0 (1)	0 (3)	**3 (3)**	0 (1)	**1 (6)**	**1 (1)**
Lateral K, Downstream of Discharge	**3 (3)**	0 (3)	0 (1)	**3 (3)**	**2 (3)**	**1 (1)**	0 (3)	**1 (3)**	0 (1)	0 (6)	**1 (1)**
Cherokee Canal, Upstream of Effluent	**1 (3)**	0 (3)	0 (1)	**3 (3)**	0 (3)	0 (1)	0 (3)	0 (3)	0 (1)	0 (6)	0 (1)
C Main Drain, Downstream of Effluent	**3 (3)**	0 (3)	0 (1)	**3 (3)**	**2 (3)**	0 (1)	0 (3)	0 (3)	0 (1)	0 (6)	0 (1)
Butte Slough at Farmlan Road	**3 (3)**	0 (3)	0 (1)	**3 (3)**	**3 (3)**	**1 (1)**	0 (3)	**2 (3)**	0 (1)	0 (6)	**1 (1)**

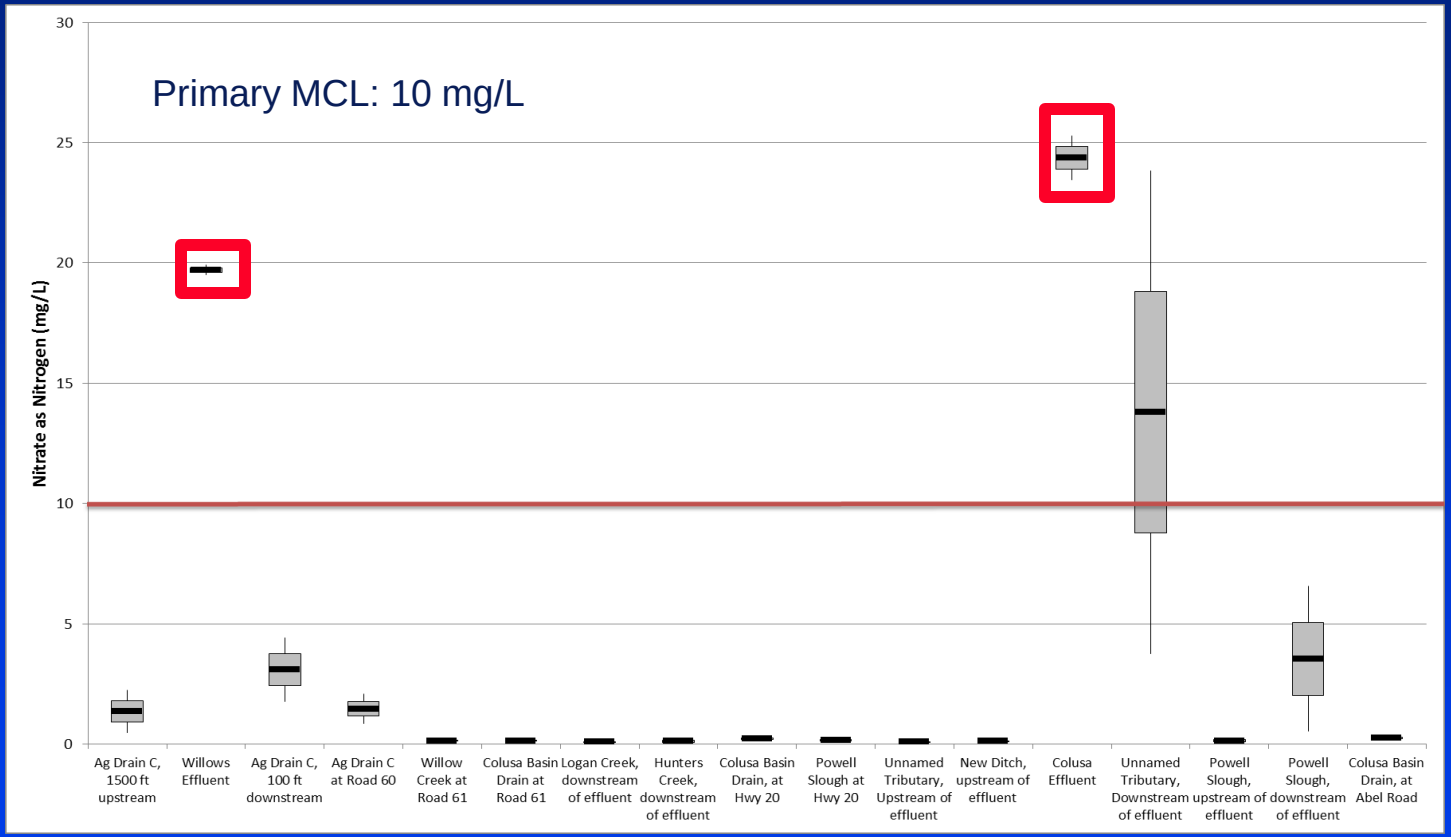
West Side – Specific Conductance (July – September 2012)



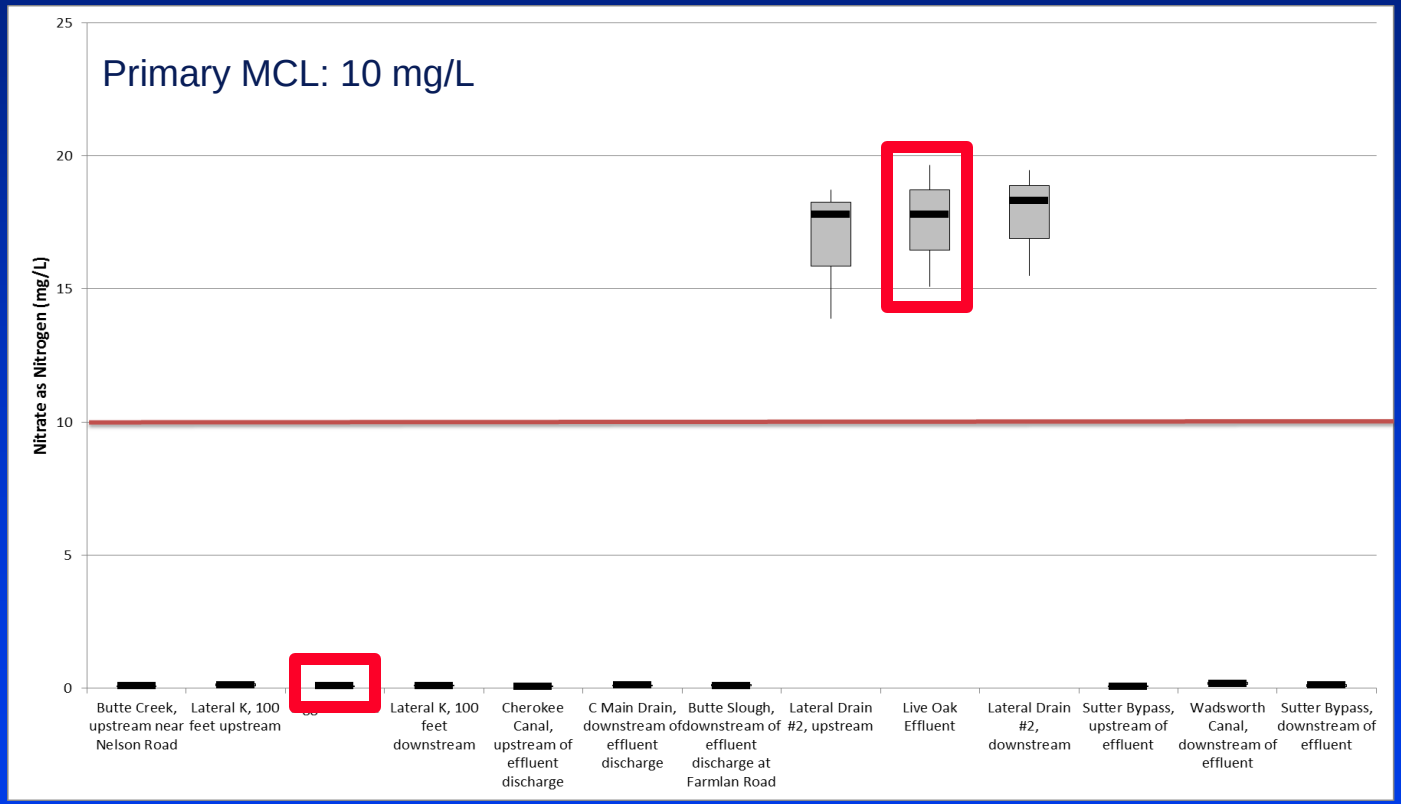
East Side – Specific Conductance (July – September 2012)



West Side – Nitrate as Nitrogen (July – September 2012)



East Side – Nitrate as Nitrogen (July – September 2012)



New Ditch (Colusa Area)

Median Conductivity: 1691 µS/cm

Lateral #2 Downstream (Live Oak Area)

Median Nitrate: 18.3 mg/L

Effluent into Lateral K (Biggs Area)

July 26, 2012

Aug 29, 2012

Sept 26, 2012

Ag Drain C Downstream (Willows Area)

Chloroform, Dibromochloromethane and Chlorodibromomethane below criteria

Summary of Exceedances (July – Sept. 2012)

	Colusa			Willows			Live Oak			Biggs		
Parameter	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream
Aluminum - Total	X		X	X		X	X		X	X		X
Arsenic - Total	X		X				X	X	X			
Arsenic - Dissolved							X	X	X			
Iron - Total	X		X	X		X	X		X	X		X
Manganese - Total	X		X	X		X	X		X	X		X
Manganese - Dissolved	X					X				X		X
Nitrate as Nitrogen		X	X		X		X	X	X			
Sodium	X	X	X	X	X	X	X	X	X		X	X
TDS	X	X	X		X		X	X	X			
Conductivity	X		X								X	
Ammonia as Nitrogen											X	X
Chloroform					X							
Bromodichloromethane					X							
Dibromochloromethane					X							

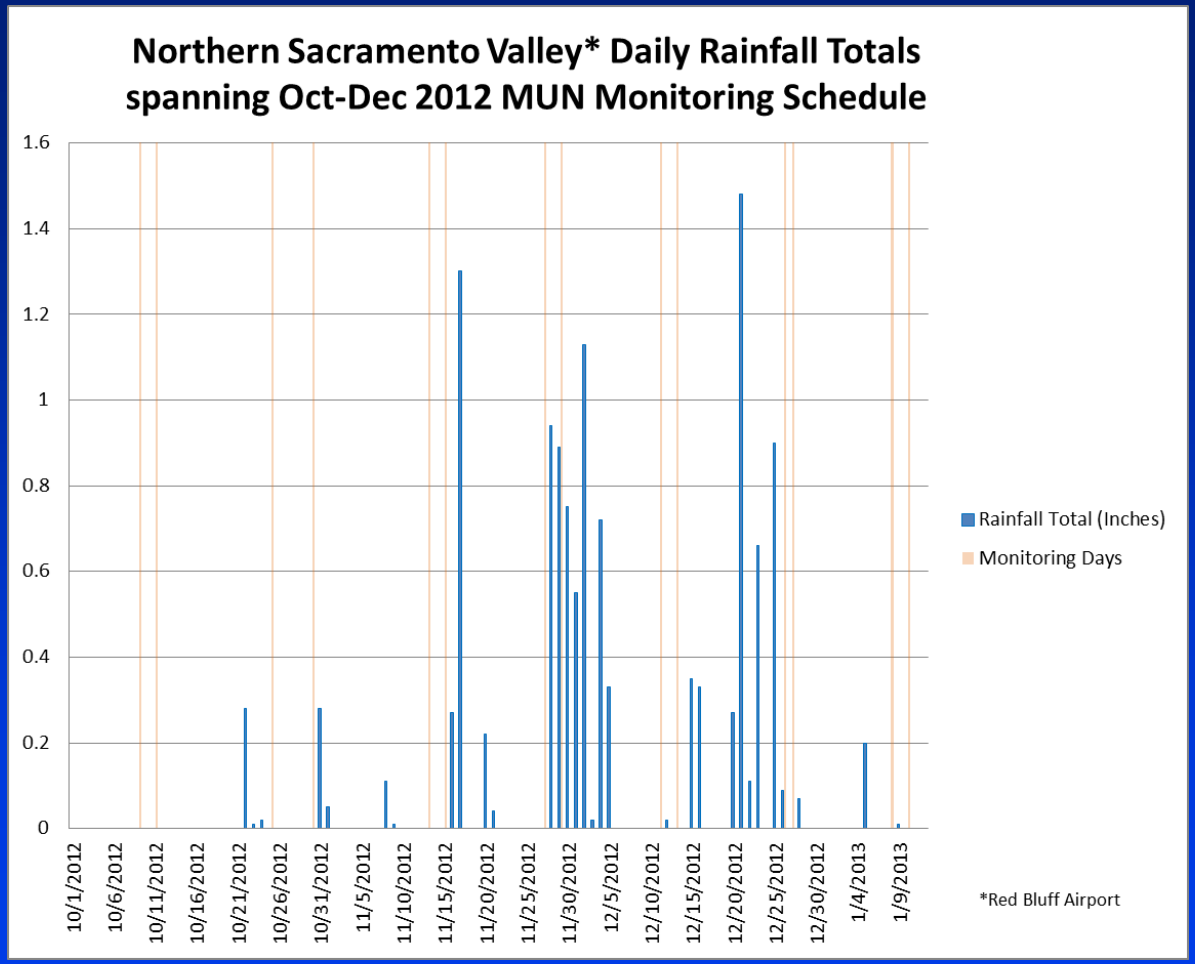
Summary of Exceedances (April – Sept. 2012)

	Colusa			Willows			Live Oak			Biggs		
Parameter	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream	Upstream	Effluent	Downstream
Aluminum - Total	X		X	X		X	X		X	X		X
Arsenic - Total	X		X				X	X	X			
Arsenic - Dissolved							X	X	X			
Iron - Total	X		X	X		X	X		X	X	X	X
Manganese - Total	X		X	X		X	X		X	X		X
Manganese - Dissolved	X					X				X		X
Nitrate as Nitrogen		X	X		X		X	X	X			
Sodium	X	X	X	X	X	X	X	X	X	X	X	X
TDS	X	X	X		X		X	X	X		X	
Conductivity	X	X	X				X	X			X	
Ammonia as Nitrogen											X	X
Chloroform					X							
Bromodichloromethane					X							
Dibromochloromethane					X							

Black X = Both QTR 2 and 3
Red Square = Only Qtr 3
Green Circle = Only Qtr 2
Blue Triangle = New Test, Qtr 3 only

Adjustments Needed?

- Recommend waiting until Storm Season results are evaluated


Northern Sacramento Valley* Daily Rainfall Totals spanning Oct-Dec 2012 MUN Monitoring Schedule
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
10/1/2012
10/6/2012
10/11/2012
10/16/2012
10/21/2012
10/26/2012
10/31/2012
11/5/2012
11/10/2012
11/15/2012
11/20/2012
11/25/2012
11/30/2012
12/5/2012
12/10/2012
12/15/2012
12/20/2012
12/25/2012
12/30/2012
1/4/2013
1/9/2013
Rainfall Total (Inches)
Monitoring Days
*Red Bluff Airport

Monitoring Costs
January 2013 – September 2013

- Not to exceed = $60,000
- Contract with BSK Laboratories in finalized for ~$45,000